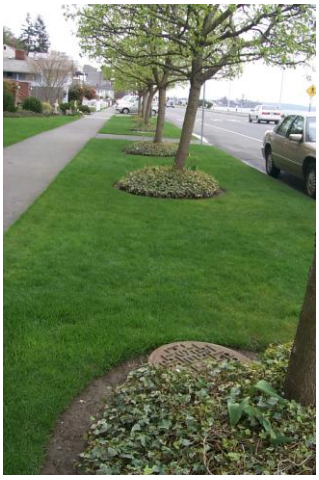
Section 15 Asset Class – Urban Forest:



Planting Strip

The SDOT Urban Forest is comprised of the publicly and privately owned and maintained vegetation that is growing within the designated street ROW within the corporate limits of Seattle. An estimated 20% of the land base in the ROW, or approximately 2800 acres, is considered plantable. SDOT has jurisdiction over the entire Urban Forest that exists in the ROW, although only a portion of the Urban Forest is actually owned by SDOT. For privately owned and maintained portions of the Urban Forest, this jurisdiction entails permitting, administration of land use and/or other municipal code requirements, and abating potential hazards to life and property.

This Asset Class originally included two (2) primary assets:

- ✓ Landscaped Areas
- ✓ Trees

During the inventory analysis efforts in 2008 and 2009, it became evident that a third primary asset exists within this class: irrigation. There are irrigation systems installed with new project –initiated plantings and SDOT assumes ownership and maintenance of these systems, although some are intentionally abandoned after the establishment period for new plantings. Full analysis of the irrigation assets has not been conducted as of this report update. All of these assets are funded through a single combined budget, and the funding requirements discussed in this section are based on an approximation of the percentage of the budget allocated to each asset. The total budget for maintenance and operation of the SDOT Urban Forest for 2010 is $3,642,874. These assets are managed by the Urban Forestry group in the Street Use and Urban Forestry Division.

Landscaped Areas:

Landscaped areas include the land and landscape-related improvements, within the street ROW.

Landscaped areas are an integral component of the transportation system. Appropriately designed and maintained landscapes ensure the safety and security of facilities for all users in a manner that preserves and protects the environment, promotes non-motorized modes of transportation, and enhances the economic viability of neighborhoods and business districts throughout the city.

Current Inventory and Anticipated Annual Growth:

Approximately 4.4% of the total plantable land base in the ROW, or an estimated 5,371,000 square feet (approximately 123 acres), is actively planted and maintained by SDOT. The landscaped areas are comprised of:

Type of Landscaped Area	Square Feet	% Total SDOT Landscape
Traffic Island Area	659,020	12
Median Area	1,236,710	23
Planting Strip Area	1,984,541	37
Under Structure Area	569,070	10.6
Traffic Circle Area	21,821	0.4
Tree Pit Area	900,000	17

SDOT has jurisdiction over an additional 16,200,000 square feet of privately owned landscaped areas within the ROW.

The inventory of landscaped area is maintained in the SDOT Hansen system, and may be displayed as a map layer in GIS. The areas are assembled into landscape complexes that serve as the asset unit for maintenance purposes. A complex may have one large landscaped area, or a few areas that are in proximity to each other, for ease of maintenance scheduling. Approximately 75,000–100,000 square feet of new landscaped areas are constructed each year. This figure represents an average taken over the last ten (10) years.

The current estimated replacement value of the landscaped areas is $33,500,000.

Condition Ratings:

SDOT has condition data on the landscape inventory dating from 1992. At that time approximately 50% of the inventory was in good condition. In the intervening years, 23% more land area has been added to the inventory without a corresponding increase in resources for maintenance. SDOT Urban Forestry (UF) now concentrates on maintaining in good condition one third (33%) of the Landscape Complexes, and the rest is not on a scheduled maintenance routine. UF crews respond on an exception basis to clean up hazardous situations, for example. As a result, the remaining complexes are not formally condition rated and are considered to be either fair or poor (meaning they have been abandoned)

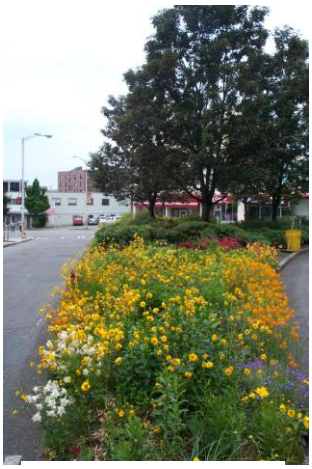
Landscape Complex Condition Assessment
2009 Estimate

% Good Condition	% Fair Condition	% Poor Condition
33	Est 33%	Est 33%

Useful Life and Life Cycle Costs:

A newly landscaped area has an estimated useful life of fifty (50) years, and in 2007 the cost for construction and first year of establishment of one (1) acre of landscaped area is $250,000, or an average of $6 per square foot. The cost to maintain a landscaped area in good condition over the fifty (50) years is $25 per square foot.

Landscaped areas that are rated in fair condition have a life expectancy of twenty (20) years or less. Even in fair condition, it will cost $5 per square foot to maintain the landscaped area over its remaining life.



Landscaped Median Island

When a landscaped area degrades to poor condition, it is no longer part of a routine maintenance plan. However, the landscaped area is still maintained as needed on an incident-response basis and will cost an average of $0.05 per square foot to do so.

Maintenance Approach:

Routine maintenance is performed in accordance with the assessed condition of the landscaped area as documented with the 2007 report. Maintenance Approach per Landscape Condition -

Landscape Condition	Maintenance Approach
Good	▪ Minimal Litter – picked up weekly, bi-weekly, or monthly as needed ▪ Minimal weeds ▪ Adequate mulch – restored annually or twice annually as required to maintain 2-3" depth ▪ Trees and shrubs both healthy and properly pruned or trimmed
Fair	▪ Litter typically present – picked up 1-2 times per year * ▪ Large weeds controlled – treated 1-2 times per year * ▪ Mulch – touched up as required to control weeds ▪ Pruning – trimmed for safety, yearly or as reported * * A higher level of maintenance is performed on these activities based on customer requests
Poor	▪ Litter - removal only to mitigate public safety hazard in response to complaint ▪ Weed control – only to mitigate a noxious weed infestation or if a public safety hazard ▪ Mulch – only as necessary to cover bare soil as a means of temporary erosion control ▪ Pruning – only to mitigate a public safety hazard

This maintenance approach has been established according to the following priorities:

- ✓ Public safety
- ✓ Maintainability of the vegetation by controlling weeds adequately so that the desired plant material can thrive
- ✓ Aesthetics

Urban Forestry requires additional funding in order to address the following maintenance objectives:

- ✓ Ensure that sight triangles are maintained in landscaped areas. This is addressed only during regular scheduled maintenance of the landscaped areas or in response to a customer request.
- ✓ Adjust irrigation systems to match vegetation needs in a manner consistent with water conservation policies to minimize water usage. System adjustments are made during scheduled maintenance at spring start-up, in response to gardener field observation, or in response to a customer request.
- ✓ Control noxious weeds in the ROW in areas other than landscaped areas. Control is based on citation by King County Weed Control Board for which mitigation is required within a two-week period, or in response to a customer request.
- ✓ Ensure that hazardous waste (primarily contaminated litter) is mitigated in all landscaped areas owned by SDOT. Approximately 25% of the landscaped areas that exist in highly urban portions of the City, such as the Central Business District which is visited twice monthly, are considered compliant, and the remaining 75% are placed on a watch list.

All active irrigation systems are tested annually, as required, to ensure backflow prevention.

Maintenance methods for landscaped areas are conducted according to progressively higher safety and environmental standards. Meeting higher standards generally means less time available for performing actual maintenance work on the landscaped area and additional unit cost to maintain.

Current Performance Measures:

Urban Forestry has established the following performance measures for landscaped areas:

Performance Measure	2009 Actual	2010 Goal
Landscaped areas restored	1 acre/ 1 acre	n/a)
Landscape Mtce, events	NA	840

For 2010 Urban Forestry has revised its accomplishment reporting to focus on the necessary level of effort required to keep seventy complexes in good condition. Making the goal of 840 maintenance events will keep the existing good complexes in that condition.

The TSP established the following performance measure for landscaped areas in 2005:

- ✓ Maintain current condition rating (30% good/70% fair or poor) through 2010

Urban Forestry 's current maintenance performance measure will ensure that this goal is met. s. It is important to note that, unfortunately, as new landscaped areas are added to the inventory, the amount of landscaped acres in fair or poor condition will increase, even though the percent will remain constant. Urban Forestry will continue its community outreach program to gain some level of support within the local community to maintain landscaped areas considered in good condition, but cannot rely on volunteers to adequately maintain these areas.

Funding Requirements:

Maintenance and Operations for Current Inventory:

The cost of maintenance and operations in 2010 totaled $1.8 m.

Maintaining Landscaped Areas in Current Condition:

The cost of maintaining landscaped areas where current condition is known is:

Landscape Condition	Average Cost to Maintain	
	Cost/sq. ft	Total
Good	0.50	$806,000
Fair	0.25	$403,000
Poor	0.05	$80,575
Total		$1,289,575

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Unmet Funding Needs:

The current funding for landscaped areas must be increased to maintain new landscaped areas that are added each year and maintain existing landscape in fair condition and prevent deterioration.

The unmet funding needs of SDOT landscaped areas are:

Action	Time Period (years)	Cost per Acre	Annual Cost
Prevent Deterioration of Current Landscaped Areas	ongoing		$109,430
Restore areas in fair condition to good condition (in addition to BTG funding - 1 additional acre)	20		$107,433
Additional cost to maintain areas restored from fair to good condition (2 acres/year)	ongoing	$10,890	$21,780 (compounded each year)
Replace areas in poor condition (2 acres/year)	20		$483,450
Additional cost to maintain replaced landscape (2 acres/year)	Ongoing	$19,602	$39,204 (compounded each year)
Maintain new landscape added each year for 1st year	Ongoing		$87,500 (compounded each year)
Maintain new landscape added each year after year 1	Ongoing		$43,750 (compounded each year)
Total			$700,313 each year + $192,234 compounded each year

Trees:

According to studies conducted by the University of Illinois, the Center for Urban Forest Research, and the International Society of Arboriculture, trees serve multiple purposes in the transportation system:

- ✓ From a transportation perspective, street trees serve as traffic calming devices along arterial corridors, and also serve as a buffer between pedestrian and vehicular traffic. A tree-lined street is more attractive to bicyclists and pedestrians and promotes these modes of transportation.
- ✓ From an environmental perspective, street trees provide storm water attenuation, remove particulate matter from the air, sequester carbon dioxide, provide wildlife habitat, and provide shade which cools the air and provides energy savings to homes and businesses.
- ✓ From a social perspective, street trees aid in the reduction of crime and contribute significantly to improvement in the general quality of life in the city.

Current Inventory and Anticipated Annual Growth:

The current inventory of SDOT –owned trees, as recorded in the Hansen system is 35, 500. In addition to these ,there are another 82,000 trees under private ownership or under the jurisdiction of other public agencies. SDOT exercises a regulatory responsibility for all street trees., SDOT Urban Forestry maintains the 35,000 trees in SDOT ownership, and those in non-SDOT ownership are maintained by private or other public entities. The BTG program has provided funding for SDOT to plant on average, 800 trees per year since 2007. Additionally trees are planted as a result of capital

projects, some of which are undertaken by other city departments, such as Seattle Public Utilities (SPU). SDOT estimates that approximately 200 trees are added to its inventory from these other projects each year. Maintenance responsibility for these trees is turned over to SDOT. Approximately 15% of the newly planted trees are undertaken as replacement of trees that have been previously removed.

The estimated replacement value of the tree inventory is $19,000,000. This replacement value reflects only the actual cost of planting 35,000 2"caliper trees and does not capture the actual value of the asset or the loss of canopy cover. (For example, the appraised value of an average 10" diameter tree is approximately $5,000, and the appraised value of an average 24" diameter tree is approximately $29,000. On a "trunk area" basis, the replacement of one (1) 20" diameter tree would require the planting of 100 2" caliper trees.)

Condition Ratings:

In 1992, a visual inspection of 23,000 trees was conducted and the condition assessed as follows:

Tree Condition Rating
January 1992

Type of Tree	% in Good Condition	% in Fair Condition	% in Poor Condition
SDOT Maintained	73	19	8
Privately Maintained	59	30	11

This condition rating included inspection of the vigor and health of the trees, and it did not assess a key element of a condition rating that considers interference with other infrastructure assets, such as low branches over streets or sidewalks. SDOT arborists estimate that approximately 4,000 of the 23,000 trees, or 17%, can be judged as in good condition using this updated criterion. Of the estimated 12,000 new trees planted since 1992, SDOT arborists estimate that 50% remain in good condition. Incorporating these considerations into the tree condition rating, provides a revised assessment of tree condition:

Revised Tree Condition Rating
SDOT Maintained Trees
July 2007 (Estimated)

Tree Population	% in Good Condition	% in Fair Condition	% in Poor Condition
Trees Planted Prior to 1992	17	75	8
Trees Planted After 1992	50	50	
All Trees	28.5	66.25	5.25

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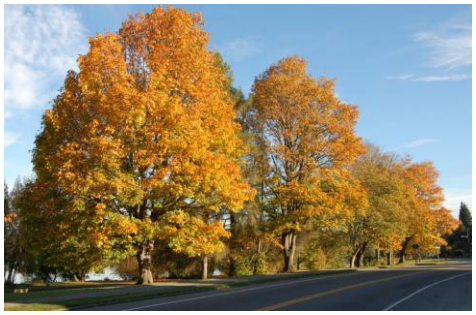
Useful Life and Life Cycle Costs:

A newly planted tree has an estimated life span of fifty (50) years, and in 2010 the cost for the purchase, planting and a 3-year establishment period for the new plant material is approximately $600. At current funding levels, SDOT performs basic maintenance on a tree which costs approximately $1,200 over the life of each tree.

Trees that are rated in fair condition have a life expectancy of 6-25 years. When a tree reaches poor condition, life expectancy is five (5) years or less. Disposal of a tree costs approximately $2,000 for removal (24" diameter at breast height (DBH)), and an additional $400 for stump removal and site preparation for new planting.

Maintenance Approach:



Street Trees along Green Lake

Prior to 2007, maintenance practices were generally reactive and were undertaken in response to customer requests rather than through scheduled maintenance to promote structure and healthy tree growth. Approximately 85% of current tree maintenance has been in response to customer request. BTG has allowed SDOT to begin transition to more routine programmed maintenance by pursuing scheduled pruning of corridors which should significantly reduce the number of customer requests. .

In 2007, for trees in poor condition, major restoration pruning or removal receives rapid attention when the tree presents a risk to public safety or blocks visibility to a traffic control device considered crucial to the safe operation of the intersection or street. Often the work performed addresses only the immediate concern and does not improve the condition rating of the tree from poor to good condition. Lower priority maintenance work on these assets could take up to eighteen (18) months or longer. At present, there is a 9-year backlog to replace a tree once it has been removed. SDOT arborists believe a more desirable maintenance strategy for trees in poor condition is to conduct the restoration pruning or removal within 120 days of the verified customer request in order to extend the life of the asset and avoid further deterioration. Once a tree is removed, replacement should be scheduled within the next eighteen (18) months, if not sooner.

Funding levels provided prior to 2007 have resulted in the following situation:

- ✓ Major Maintenance Backlog – Approximately 500 trees have died and not been replaced over the last ten (10) years. Crews now replace 75-150 each year.
- ✓ Routine Maintenance Backlog – Urban Forestry has over 150 outstanding tree service requests, a number which has remained fairly constant over the last several years. Proactive corridor pruning for vehicle and pedestrian clearance is performed on a very infrequent basis. Additional resources are required to address the maintenance needs of new assets once they transition from the 3-year establishment period.
- ✓ Operations Backlog – Urban Forestry receives 40-60 customer calls on a daily basis which results in most field staff having a continual backlog of approximately forty (40) inspection requests, some of which are converted to work orders which add to the routine maintenance backlog.

Current Performance Measures:

Urban Forestry has established the following performance measures for trees:

Performance Measure	2009 Actual	2010 Goal
Trees planted	818	800
Trees pruned	3569	3000

Funding Requirements:

Maintenance and Operations:

In 2010, the actual costs for maintenance and operations totaled $1.7 million. .

Maintaining Trees in Current Condition:

The extent of the BTG-funded pruning is to address public safety concerns and reduce conflicts with other infrastructure assets. Additional funding is needed to allow Urban Forestry to address structural anomalies of the tree which, if not addressed, will allow a tree to degrade from good to fair condition.

To maintain the trees, including the newly-planted trees, at their current condition ratings and prevent deterioration would require two (2) additional tree crews at an annual cost approximating $750,000. Additional funds would be needed for tools and equipment for the crews.

Raising the Condition of Trees Rated in Fair Condition to Good Condition:

Street Tree: Tupelo

Over 65% of SDOT trees are rated in fair condition. The addition of two (2) tree crews, as stated above, will allow SDOT to prevent further deterioration. If the condition of these trees is to be raised to good condition, it will require additional pruning to correct tree conflicts with private infrastructure and perform all of the pruning necessary for the long-term health and viability of the tree. The Society of Municipal Arborists recommends a 7-year pruning cycle for mature trees (minimum 21" DBH), and a 3-5 year pruning cycle for small trees. The addition of two (2) additional tree crews and a tree crew supervisor would be required to raise the condition of the trees rated in fair condition to good condition over a period of six (6) years at an annual cost of $869,000.

Replacing the Trees Rated in Poor Condition:

Approximately 1,837, or 5.25%, of the SDOT-owned trees are considered in poor condition. Trees in this condition require replacement. The removal and replacement of all of these trees would cost $5,327,300. If addressed over a twelve (12) year period, this would cost approximately $445,000 per year. This would require an additional tree crew at a cost of $369,000 annually.

In 15-20 years, a greater number of trees will reach an age that will suggest they be removed and replaced. The majority of SDOT trees were planted in the mid 1970s. Given an estimated life span of fifty (50) years, removal and replacement figures may be 4-5 times higher within twenty (20) years.